

CLAIMS:**WHAT IS CLAIMED IS:**

1. A polymerization process, comprising;
passing a feed stream comprising liquid and gas through a feed stream inlet disposed proximate an upflow polymerization reactor;
passing the feed stream through a member configured to impart an angular velocity to the feed stream and entrain the liquid in the gas; and
contacting the feed stream with a catalyst to polymerize the feed stream.
2. The process of claim 1, wherein the member is substantially flat and includes a plurality of apertures and wherein the feed stream passes through the plurality of apertures, which imparts the angular velocity to the feed stream.
3. The process of claim 1, wherein the member includes housing having an aperture comprising a stationary vane and wherein the feed stream passes through the plurality of apertures, which imparts the angular velocity to the feed stream.
4. The process of claim 1, further comprising passing at least a portion of the feed stream through a plate having a channel disposed therein prior to passing the feed stream through the member.
5. The process of claim 1, wherein a pressure drop exists between the feed stream inlet and the catalyst of from about 5 psig to about 7 psig.
6. The process of claim 1, wherein the feed stream comprises less than about 25% liquid.
7. The process of claim 1, wherein the feed stream passing through the member has substantially the same angular velocity at different radial member locations.

8. The process of claim 1, wherein the feed stream passing through the member has multiple angular velocities at different radial member locations.
9. A polyethylene polymerization process, comprising:
 - passing a ethylene feed stream comprising a liquid and gas mixture that includes ethylene monomers through a feed stream inlet disposed proximate an upflow polymerization reactor;
 - passing the ethylene feed stream through a member configured to impart an angular velocity to the ethylene feed stream and further mix the liquid in the gas, providing an entrained ethylene feed stream; and
 - contacting the entrained ethylene feed stream with a catalyst to polymerize the monomers and to form polyethylene.
10. The process of claim 9, wherein the catalyst is a metallocene catalyst.
11. The process of claim 10, wherein the metallocene catalyst is supported.
12. The process of claim 11, wherein the support is selected from the group consisting of silica, alumina, silica-alumina, and mixtures thereof.
13. The process of claim 12, wherein the support is silica
14. An upflow polymerization reactor, comprising:
 - a housing having a lower region and an upper region, the upper region and lower region being separated by a catalyst bed;
 - a feed stream inlet disposed proximate the lower region of the housing configured to pass a feed stream therethrough comprising liquid and gas;
 - a fluid outlet disposed proximate the upper region of the housing; and

a member mounted in the housing between the feed stream inlet and the catalyst bed comprising a plurality of apertures positioned at an angle of greater than about 0 degrees and less than about 90 degrees from horizontal.

15. The reactor of claim 14, wherein the apertures are positioned at an angle of from about 30 degrees to about 60 degrees from horizontal.

16. The reactor of claim 14, wherein the apertures are positioned at substantially the same angle from horizontal.

17. The reactor of claim 14, wherein the apertures are positioned at different angles from horizontal.

18. The reactor of claim 14, further comprising a plate mounted in the housing proximate the feed stream inlet and below the member having a channel disposed therein.

19. The reactor of claim 14, further comprising a plate mounted in the housing proximate the feed stream inlet and below the member having a channel disposed therein and being operably connected to the member.

20. The reactor of claim 14, further comprising a plate mounted in the housing proximate the feed stream inlet and below the member having a channel disposed therein and being integral with the member.